

Amendments to the Specification

Please amend the title as follows:

FUEL TANK FUELING DEVICE WITH CAM MECHANISM

Please insert the paragraph beginning at page 1, line 4 as follows:

This application is a divisional application of U.S. Patent Application Serial No. 09/757,643, which is based upon and claims the benefit of Japanese Patent Application Nos. 2000-6271 filed on January 12, 2000, 2000-269619 filed on September 6, 2000 and 2000-85494 filed on March 27, 2000, the contents of which are incorporated herein by references.

Please amend the paragraph beginning on page 13, line 7 as follows:

Fig. 11 Figs. 11A – 11B is a are cross section sections of the filler neck and the fuel cap while the fuel cap is removed;

Please amend the paragraph beginning on page 13, line 16 as follows:

Fig. 18 Figs. 18A – 18B is an are illustration illustrations of the fuel cap and the neck side and that together show the engagement between the fuel cap and the neck side guides of the filler neck;

Please amend the paragraph beginning on page 14, line 4 as follows:

Fig. 27 Figs. 27A – 27B is an illustration are illustrations of the operations for opening and closing the fuel cap;

Please amend the paragraph beginning on page 14, line 5 as follows:

~~Fig. 28 Figs. 28A – 28B is an illustration are illustrations~~ of the opening and closing operations subsequent to ~~Fig. 27 Figs. 27A – 27B~~;

Please amend the paragraph beginning on page 14, line 7 as follows:

~~Fig. 29 Figs. 29A – 29B is an illustration are illustrations~~ of the opening and closing operations subsequent to ~~Fig. 28 Figs. 28A – 28B~~;

Please amend the paragraph beginning on page 17, line 5 as follows:

The inner lid 50 is ultrasonically welded to the periphery of the opening 24a of the valve chamber-forming element 22, thereby covering the opening 24a. The inner lid 50 comprises a center depression 52 in the center of the inner lid main body 51. A cylindrical support 53 protrudes along the outer periphery of the center depression 52. The cylindrical support 53 is formed in the shape of a cylinder that may be inserted into the opening 24a of the valve chamber-forming element 22. The outer periphery of the inner lid main body 51 serves as an outer disk 54. Positioning ribs [57] 55 are formed in four equidistant locations around the outer periphery of the outer disk 54. The positioning ribs [57] 55 protrude downward so as to be insertable into the hollow component 27. Passage holes 58 are opened in the inner lid 50, connecting the valve chamber 23 and exterior.

Please amend the paragraph beginning on page 19, line 18 as follows:

The lid 40 is attached to the casing main body 20, and comprises an upper plate 41

and side wall 42, being formed in the shape of a cap surrounded by the upper plate 41 and side wall 42. An engagement step 42a for attachment to the casing main body 20 upon engagement with the upper engagement 22b of the flange 22a of the casing main body 20 is formed on the inside of the side wall 42. This structure allows the lid 40 to be attached to the top of the casing main body 20 via the upper engagement 22b of the flange 22a [ad] and engagement step 42a. A handle 43 for opening and closing the fuel cap 10 is provided at the top of the upper plate 41.

Please amend the paragraph beginning on page 24, line 16 as follows:

A fueling mechanism comprising a fuel cap 100 in a second embodiment is described below. Figures 10, 11A and 11B illustrate a fuel mechanism comprising such a fuel cap 100 in the second embodiment. Figure 10 illustrates a state closed by the fuel cap 100, and Fig. 11 Figs. 11A – 11B illustrates illustrate a state with the fuel cap 100 removed. In Figs. 10 and 11B, the inlet FNb of the fueling mechanism is opened and closed by attaching and detaching the fuel cap 100 to and from the guide 210 held in the filler neck FN. The structure of the casing main body 112 is characterized in that the fuel cap 100 is divided into two parts: a rotating casing 120 and a sliding casing 130. The rotating casing 120 is rotated with the lid 140 to move the sliding casing 130 up and down, creating a seal with the gasket GS1.

Please amend the paragraph beginning on page 25, line 1 as follows:

The structures of the various parts of the fueling mechanism are described below. As shown in Fig. 11B, the inlet pipe IP has a filler neck FN at the top, and is connected to the tank main body (not shown) through the fuel passage IPa from the filler neck FN. A seat

surface IPd is formed in the shape of a ring at the bottom step of the filler neck FN. The seat surface IPd is sealed by the gasket GS1 of the fuel cap 100. A guide 210 detachably attaching the fuel cap 100 is held in the filler neck FN.

Please amend the paragraph beginning on page 25, line 7 as follows:

Figure 12 is an oblique view of the periphery of the guide 210 and filler neck FN. As shown in Fig. 12, the guide 210 comprises a pipe main body made of a resin cylinder. Rotation detents 212 for regulating the rotating of the sliding casing 130 (Fig. 11A) are formed in four locations on the inner wall of the pipe main body 211. A ring-shaped detent 213 extending in the form of a ring is formed at the opening of the pipe main body 211, and insertion notches 214 for the insertion of the casing are formed in a portion of the ring-shaped detent 213.

Please amend the paragraph beginning on page 30, line 6 as follows:

~~Figure 18 is an illustration~~ Figures 18A – 18B are illustrations of the engagement between the fuel cap 310 and the means for preventing extraction and rotation in the filler neck FN. As shown in Fig. 18B, neck side guides GN and Gn acting as means for preventing casing 312 from being pulled off or rotated are formed in two axially symmetrical locations on the inner wall of the filler neck FN. The neck side guide GN is enclosed, in the form of a square with one side missing, by a top stopper wall GNa, side wall GNb, and bottom wall GNc, the space therein acting as a guide groove GNd. Insert notches GNe and GNe that are open in the axial direction and that allow the insertion of the casing 312 are formed in the space between the neck side guides GN and Gn, which is the opening of the filler neck FN. A rotating detent GNf is also formed on the side of the bottom wall GNc.

Please amend the paragraph beginning on page 30, line 17 as follows:

Support ends 326 are formed on the outer periphery of the rotating casing 320, and guide protrusions 335 protrude on the outer periphery of the sliding casing 330. The support ends 326 and guide protrusions 335 are provided on opposite sides, pivoting on the casing 312. The support ends 326 and guide protrusions 335 may be inserted into the insert notches GNe of the neck side guides GN. The support ends 326 may be inserted into the guide groove GNd by rotating the rotating casing 320. The guide protrusions 335 come into contact with the rotating detent GNf (Fig. 27B) to stop the rotation.

Please amend the paragraph beginning on page 36, line 5 as follows:

The operations by which the fuel cap 310 opens and closes the inlet FNb and the accompanying sealing operations of the gasket GS2 are described below. Figures 23 through 26 are cross section of a series of operations for closing the inlet FNb with the fuel cap, while Figs. 27A through 29B illustrate the operations of the cam mechanism.

Please amend the paragraph beginning on page 36, line 13 as follows:

The handle 343 of the lid 340 is taken in hand as shown in Fig. 23, and the support ends 326 of the rotating casing 320 and the guide protrusions 335 of the sliding casing 330 are aligned with the insert notches GNe of the filler neck FN (Fig. 18B) to insert the casing 312 into the filler neck FN (state in Fig. 24). As a result, the guide protrusions 335 are

positioned at the end of the rotating detent GNf, as shown in Fig. 27B, so the rotation of the sliding casing 330 is regulated relative to the filler neck FN.

Please amend the paragraph beginning on page 36, line 20 as follows:

Then, as shown in Fig. 25, the lid 340 is pressed down against the urging force of the plastic spring 347, and the clutch 345 is engaged (state in Fig. 22). When the lid 340 is rotated clockwise, the rotating casing 320 rotates clockwise with the lid 340 (state in Fig. 26). At this time, the cam mechanism moves from the state in Fig. 27A to that in Fig. 28A. That is, the cam protrusion 324 disengages from the cam recess 392a of the cam ring 390, travels down the sloped surface of the peak 392, and moves to the flat component 393. At this time, the support ends 326 are guided by the guide groove GNd, and the movement upwards is regulated by the top stopper wall GNa, so that the sliding casing 330 is moved downward by the accumulated spring force in the spring 400 (Fig. 26). That is, the distance between the cam spring 390 and the cam protrusion 324 is shortened, and the sliding casing 330 is moved downward by the urging force of the spring 400. As a result, the gasket GS2 is pressed to the set surface IPd to create a seal in the space there. When the lid 340 is further rotated, the cam protrusion 324 moves while following the flat component 393, as shown in Fig. 29A, the support ends 326 move in the guide groove GNd, and the fuel cap 310 stops the rotation to conclude the closing operation while the cam protrusion 324 is positioned in the cam recess 393a (state in Fig. 16).

Please amend the paragraph beginning on page 37, line 12 as follows:

The operations for removing the fuel cap 310 from the filler neck FN are described below. When the lid 340 is pressed down, and the clutch 345 is engaged for counterclockwise rotation to move from the state in Fig. 16 to the state in Fig. 26, the cam protrusion 324 disengages from the cam recess 392a of the peak 392, as shown in the transition from Fig. 29A through Fig. 28A to Fig. 27A. At this time, the cam protrusion 324 rides up into the peak 392, thereby pushing the sliding casing 330 against the urging force of the spring 400. This allows the gasket GS2 mounted at the bottom of the sliding casing 330 to separate from the seat surface IPd. In this state, as shown in Fig. 27B, the support end 326 of the rotating casing 320 are aligned with the insertion notches GNe, resulting in a position where the fuel cap 310 is taken out. The fuel cap 310 is picked up, so that the fuel cap 310 is removed, allowing a fuel gun to be inserted into the inlet FNb for fueling.